

## RIVERS AND FLOODS

By H. E. FRANKENFIELD

Between September 28 and 30 heavy to excessive rains fell over the Middle and South Atlantic States, and from South Carolina northward except along the coast the total fall was approximately from 4.50 to 6 inches. Floods followed quickly, of course, and they were general throughout the area covered by the heavy rains.

In the Hudson and Mohawk Rivers the flood was not severe, and the flood stage was reached at only one point, Troy, N. Y., where the crest stage was 0.5 foot above the flood stage of 15 feet between 9 and 10 p. m., October 1. That at Albany, N. Y., was 0.6 foot below the flood stage of 12 feet, two or three hours later. Warnings were issued in ample time to protect and save property and no damage was reported.

The Delaware River was not in flood except in the vicinity of Phillipsburg, N. J., where the flood stage of 22 feet was reached at 9 p. m. October 1. In this the Lehigh River was an important factor, as the flood stage of 12 feet at Mauch Chunk, Pa., was exceeded by 0.7 foot at 6 p. m. September 30, after a 24-hour rainfall of 5.51 inches. At Allentown, Pa., 30 miles below Mauch Chunk, the crest stage was 13.8 feet, 0.2 foot below the flood stage, at 11:10 p. m. September 30. The flood in the Schuylkill River paralleled that in the Lehigh in point of time, and at Reading, Pa., the crest stage was 16.6 feet, 6.6 feet above the flood stage, at 1 a. m. October 1. Warnings were issued on the morning of September 30, and were of great value to the enormous manufacturing industries along the Schuylkill. Some unavoidable damage resulted through wetting of goods and loss of time, but the losses were not great.

While floods were general in the North Branch of the Susquehanna River and its tributaries, the flood stages were not greatly exceeded, as the weather had been dry during the preceeding two weeks and the rivers were at the seasonal low stages. Warnings were issued promptly on the morning of September 30, but, nevertheless, the damage and loss at and above Binghamton, N. Y., almost entirely unavoidable, amounted to about \$750,000. Crop losses reported aggregated \$198,850, and those to buildings, highways, and bridges, \$83,100. The value of property saved through the warnings did not exceed \$15,000.

Flood stages did not extend very far below Wilkes-Barre, Pa., yet much damage was done, notwithstanding the warnings, and from the mouth of the Juniata to Harrisburg, Pa., the estimated losses were not less than \$250,000, of which \$50,000 was from loss of material at Clark's Ferry, at the mouth of the Juniata River, where a new bridge over the Susquehanna River is in course of construction.

There were no floods in the Potomac River drainage area, nor in the upper James River of Virginia. In the lower James there was a severe flood, beginning at Columbia at the mouth of the Rivanna River. At Columbia the crest stage was 31.3 feet, or 13.3 feet above the flood stage, at 9 a. m. October 1, following a rainfall of 4.63 inches, while at Richmond the crest stage was 19.4 feet, 9.4 feet above the flood stage, on the morning of October 2. Warnings were timely, but unavoidable losses in crops were considerable, and the damage to highways and bridges amounted to about \$100,000. Losses occasioned by suspension of business amounted to \$9,000, while the reported value of property saved through the flood warnings was \$50,000.

The Roanoke River of Virginia and North Carolina and the other rivers of central and eastern North Carolina were in severe flood, the crests having been far above the flood stages, as much as 14 feet in portions of the Tar and Cape Fear Rivers. Warnings of severe floods were issued on September 29 and 30, and all were well verified.

North Carolina floods seldom occur at this season of the year, and these were the greatest of record for the month of October. The total rainfall immediately preceding the floods was 10 inches or more, and only the dryness of the soil at the outset prevented still greater floods. As a rule the high waters continued during the first 10 days of October. Losses as reported were \$205,500, of which \$150,000 was in crops. Value of property saved through warnings, \$147,000.

Floods in the rivers of South Carolina were also severe and the necessary warnings were issued on September 30. At Conway, S. C., on the Waccamaw River, the crest stage of 11.1 feet on October 9 and 10 was 4.1 feet above the flood stage and 0.9 foot above the previous high-water mark of September 7, 1908. The damage done along the Waccamaw River amounted to about \$80,000 and the value of property saved through the warnings, \$5,000. Along the Pee Dee River the loss and damage, exclusive of railroad losses, were about \$50,000, and the value of property saved through the warnings \$250,000. On the Black River damage to roads and bridges amounted to \$3,000.

The Santee River had been in flood since September 17<sup>1</sup> and the heavy rains of the last three days of the month carried the river to much greater heights, Rimini, S. C., reporting a stage of 20.3 feet on October 4, or 8.3 feet above flood stage. The river remained above the flood stage until about October 18. The usual warnings were issued at the proper time. The losses reported were quite small, considering the severity of the floods, \$25,750 in crops, \$4,450 in livestock and other movable property, and \$4,810 through enforced suspension of business. The value of property saved through the warnings was given as \$52,700.

The floods in the Altamaha system of Georgia were only moderate, and no damage was reported. Warnings were issued as indicated.

Over the remainder of the country the usual low-water conditions incident to the season prevailed.

River and station	Flood stage	Above flood stages—dates		Crest	
		From—	To—	Stage	Date
ATLANTIC DRAINAGE					
Hudson:	<i>Feet</i>			<i>Feet</i>	
Troy, N. Y.....	15	1	1	15.5	
Delaware:					
Phillipsburg, N. J.....	22	1	1	22.0	
Lehigh:					
Mauch Chunk, Pa.....	12	(1)	(2)	12.7	Sept. 3
Schuylkill:					
Reading, Pa.....	10	(1)	1	16.6	
Susquehanna:					
Bainbridge, N. Y.....	11	1	2	17.0	
Binghamton, N. Y.....	14	(1)	2	17.2	
Towanda, Pa.....	16	1	1	16.9	
Wilkes-Barre, Pa.....	20	1	2	22.4	
Unadilla:					
New Berlin, N. Y.....	8	1	1	8.6	
Chenango:					
Sherburne, N. Y.....	8	(1)	(2)	8.0	Sept. 3
James:					
Columbia, Va.....	18	(1)	2	31.3	
Richmond, Va.....	10	1	3	19.4	
Roanoke:					
Randolph, Va.....	21	1	2	27.5	
Weldon, N. C.....	30	(1)	5	42.1	

<sup>1</sup> Continued from last month.

<sup>2</sup> Below flood stage at 8 a. m., Oct. 1, 1924.

<sup>3</sup> Approximately.

EFFECT OF WEATHER ON CROPS AND FARMING  
OPERATIONS, OCTOBER, 1924

By J. B. KINCER

River and station	Flood stage	Above flood stages—dates		Crest	
		From—	To—	Stage	Date
ATLANTIC DRAINAGE—continued					
Dan:	Feet			Feet	
Danville, Va.....	8	1	1	10.4	1
Clarksville, Va.....	12	2	3	12.5	2
Tar:					
Rocky Mount, N. C.....	9	(1)	5	15.0	1
Tarboro, N. C.....	18	1	9	32.3	4
Greenville, N. C.....	14	2	11	23.5	6
Fishing Creek:					
Enfield, N. C.....	15	(1)	3	17.3	1-2
Neuse:					
Neuse, N. C.....	15	(1)	5	20.7	2
Smithfield, N. C.....	14	(1)	7	24.0	1
Cape Fear:					
Fayetteville, N. C.....	35	(1)	4	49.6	2
Elisabethtown, N. C.....	22	(1)	7	33.8	3
Haw:					
Moncure, N. C.....	22	(1)	1	24.6	Sept. 30
Waccamaw:					
Conway, S. C.....	7	(1)	20	11.1	9-10
Peedee:					
Cheraw, S. C.....	27	1	4	34.7	2
Mars Bluff, S. C.....	17	1	11	21.9	6
Lynches:					
Effingham, S. C.....	14	6	6	14.4	6
Black:					
Kingstree, S. C.....	12	(1)	8	14.5	2
Santee:					
Rimini, S. C.....	12	(1)	13	20.3	4
Ferguson, S. C.....	12	(1)	18	15.2	6
Catawba:					
Catawba, S. C.....	12	(1)	1	18.3	1
Wateree:					
Camden, S. C.....	24	1	4	30.2	2
Congaree:					
Columbia, S. C.....	15	(1)	2	21.0	1
Broad:					
Blairs, S. C.....	15	(1)	2	24.0	1
Saluda:					
Pelzer, S. C.....	7	(1)	1	8.0	Sept. 30
Chappells, S. C.....	14	(1)	2	19.0	1
Oconee:					
Milledgeville, Ga.....	23	(1)	1	31.5	Sept. 26
Dublin, Ga.....	22	(1)	(2)	23.3	Sept. 30
		3	3	22.1	3
Ocmulgee:					
Macon, Ga.....	18	(1)	(2)	18.4	Sept. 30
Abbeville, Ga.....	11	1	9	12.4	6
MISSISSIPPI DRAINAGE					
Shenango:					
Sharon, Pa.....	9	(1)	2	9.4	1
Holston (North Fork):					
Mendota, Va.....	8	(1)	(2)	8.0	Sept. 30
PACIFIC DRAINAGE					
Willamette (Coast Fork):					
Saginaw, Ore.....	9	31	(4)		

- 1 Continued from last month.  
 2 Below flood stage at 8 a. m., Oct. 1, 1924.  
 3 Approximately.  
 4 Continued at end of month.

## MEAN LAKE LEVELS DURING OCTOBER, 1924

By UNITED STATES LAKE SURVEY

(Detroit, Mich., November 6, 1924)

The following data are reported in the "Notice to Mariners" of the above date:

Data	Lakes <sup>1</sup>			
	Superior	Michigan and Huron	Erie	Ontario
Mean level during October, 1924:	<i>Feet</i>	<i>Feet</i>	<i>Feet</i>	<i>Feet</i>
Above mean sea level at New York.....	601.89	579.18	571.70	245.45
Above or below—				
Mean stage of September, 1924.....	0.00	-0.33	-0.25	-0.20
Mean stage of October, 1923.....	-0.11	-0.20	+0.47	+0.80
Average stage for October last 10 years.....	-0.72	-1.18	-0.35	-0.20
Highest recorded October stage.....	-1.75	-3.86	-2.00	-2.36
Lowest recorded October stage.....	+0.31	-0.20	+0.90	+1.78
Average relation of the October level to—				
September level.....		-0.25	-0.3	-0.4
November level.....		+0.2	+0.25	+0.20

<sup>1</sup> Lake St. Clair's level: In October, 1924, 574.38 feet.

**General summary.**—Following the damaging frost which occurred in the Central-Northern States, including the upper Mississippi Valley, at the close of September, warm, sunshiny weather prevailed throughout the interior of the country, and was very favorable for maturing late crops and for farm work, especially for fall seeding. The unusually heavy rainfall during the first half of the month between the western upper Lake region and Rocky Mountains, while favorable in conditioning the soil for plowing and for fall-seeded grains, was somewhat unfavorable for farm work, especially for late threshing.

In much of the Atlantic coast area, where September was too wet for agricultural interests, the crop situation was markedly improved by the cessation of rainfall at the beginning of the month, and the period of dry, sunshiny weather which followed permitted rapid progress in field work, while late crops showed general improvement. It became too dry, however, in these sections the latter part of the month, though timely and beneficial showers occurred near the close. In central and west Gulf areas, where moisture had been deficient quite generally during much of the growing season, the persistent absence of material rainfall was unfavorable, and it was decidedly too dry for plowing and fall planting, while pastures were bare and stock water scarce.

In the Northwestern States farm work progressed under favorable weather conditions, with soil moisture mostly sufficient, though more rain was needed in the far Southwest. On the other hand, the agricultural outlook was greatly improved in central and northern Pacific coast districts by reason of better moisture conditions. In northern Plateau sections, light to moderate rains during the latter part of the month were very helpful, but in southern California it continued too dry.

**Small grains.**—During the first half of the month there was considerable interruption by rain to threshing in the Spring Wheat Belt, but elsewhere late threshing made good progress. Splendid weather prevailed for seeding winter wheat in the principal producing area, with the soil in good condition nearly everywhere, although in many parts of the Wheat Belt, more moisture was needed during the latter part of the month. It had also become too dry in the Southwest, where early seeded wheat made slow growth, and the late sown needed moisture for germination. Rains during the latter part of the month were very beneficial for this crop in the more northwestern States, especially in the eastern portions of Washington and Oregon, and in Idaho.

**Corn.**—Following the killing frost in the northwestern portion of the Corn Belt at the close of September, there was a reaction to much warmer weather, with very little rain and abundant sunshine, which conditions prevailed during most of October. The corn crop in the greater part of the large producing areas matured slowly and was very late in ripening and, while the frosted corn dried out well during the month, there was much complaint of chaffy ears and light yields. In most of the central valley States the first killing frost of the season was delayed until about the 25th of October, which permitted much corn to mature that would have been damaged if frost had occurred as early as in an average year.